

KODAK

photo notes

for registered owners of the
Kodak Reference Handbook
and the
Kodak Photographic Notebook

Exposure

with portable Electronic Flash Units



This article discusses how to properly expose Kodak Films by the light of the small portable type of electronic flash unit rated at anywhere from 50 to 200 wattseconds.

Wattsecond Ratings. To anyone who takes electronic flash pictures, the flash guide number holds the answer to the proper exposure of whatever film he is using. At present, the usual way to indicate the power of an electronic flash unit is to give the number of wattseconds of electrical energy that is fed into the flash tube. But, in photography, the basic question is usually, "How much light is there." And, because wattseconds are units of power, a specification in wattseconds does not tell how much *light* a unit throws on a subject. In other words, wattseconds *cannot* be converted directly into guide numbers.

Recently, it has been recognized that by properly measuring the amount of

light that actually reached the subject, making these measurements in "beam" or more correctly "effective" candle power seconds, a figure can be obtained that *can* be converted directly into flash guide numbers that work.

However, it is important to keep in mind that "wattseconds" is not entirely meaningless as an indication of how much light a unit puts out. Very roughly, a 100-wattsecond unit might be expected to give a guide number somewhere between 30 and 40 for Kodachrome Film, Daylight Type; between 40 and 55 for Kodak Ektachrome Film, Daylight Type; and between 140 and 200 for Kodak Tri-X.

Exposure Guide Numbers. These can be calculated directly from "beam - candlepower seconds" or, more accurately, the "effective candlepower-second" output, if this fig-

ure has been accurately furnished. This is described later.

The best guide number for your use is one which you establish photographically as follows: At 10 feet from typical subject matter, expose Kodachrome or Kodak Ektachrome Film at $f/2.8, 3.5, 4, 4.7, 5.6, 6.5$, and 8. After processing, project the slides correctly, choose the best f -number, and multiply it by 10. This gives the best guide number for your flash unit, camera and subject matter.

Shutter time does not affect the guide number for electronic flash. The test is made with reversal color film because its exposure is critical. From the value so obtained, guide numbers can be found for black-and-white films. However, because of the wide latitude of black-and-white film, the reverse is not true.

Guide numbers for other films can be found from:

$$\frac{G.N. \text{ film A}}{G.N. \text{ film B}} = \sqrt{\frac{\text{Daylight Exp. index film A}}{\text{Daylight Exp. index film B}}}$$

For Ektachrome, double (1.8 times) a known accurate Kodachrome guide number.

Duration of Flash. The average total duration of flash is about $1/250$

second, but the photographically useful part of the flash (strongest %) averages $1/1000$ second. This is much longer than the flash from the larger studio outfits. At portable unit exposure times ($1/250$ to $1/2000$), there is no film-speed change or reciprocity effect great enough to be detectable even in carefully made pictures, for either black-and-white or color films. **Timing of Flash.** For practical purposes, the flash follows instantaneously the closing of shutter contacts. Therefore, the usual synchronization (delayed) is not used (unless the unit has a built-in "F" or "M" delay). The "X" setting is generally used so that contact is made when the shutter blades are fully open. You can check synchronization easily. When the camera is empty, work the shutter while looking through the camera from the back. If the shutter blades appear fully open as flash occurs, synchronization is correct.

Filters Required for Color Film

Many photographers find that the use of daylight-type color film without a light-balancing filter yields transparencies of quite good color balance. In some cases, however, more accurate color balance may result when a

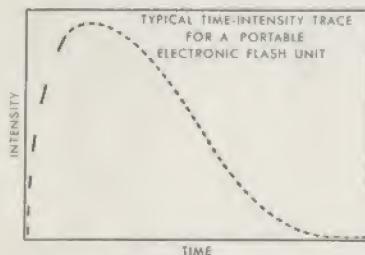
GUIDE NUMBERS FOR KODAK FILMS WITH PORTABLE ELECTRONIC FLASH UNITS

KODAK FILM	(DAYLIGHT) EXPOSURE INDEX	EFFECTIVE CANDLEPOWER SECONDS OUTPUT \times F. UNIT									
		350	500	700	1000	1400	2000	2800	4000	5600	8000
PLUS-X	50	32	40	45	55	65	80	100	110	130	160
TRI-X	200	65	80	95	110	130	160	200	220	260	320
KODACOLOR	25	24	28	32	40	45	55	70	80	95	110
KODACHROME	10	15	18	20	26	30	35	45	50	60	70
EKTACHROME (New High Speed)	32	26	32	35	45	55	65	80	90	110	130

Kodak Light Balancing Filter No. 81A is used, especially with new lamps. A one-third lens opening larger is required when this filter is used. As lamps age, they may change somewhat in light quality, and no filter may then be needed.

Most of these units produce light of practically identical color. Therefore, the same filters can be used.

Charging Time. As can be seen from

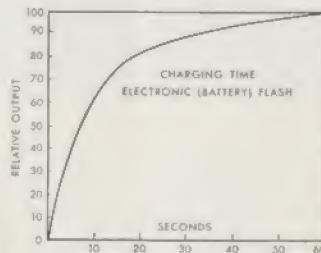


the accompanying curve, it usually takes a minute to recharge the unit to fullest capacity with batteries, but after 10 seconds a typical unit will produce about 70 percent of its maximum light output. An a-c power unit is usually quicker in recharging.

Other Causes of Light Loss. As batteries lose power due to use and age, the necessary charging time increases. When the battery is used to the extent that its voltage drops below the required value, light output decreases. Another factor which can weaken the batteries and thus result in loss of light output is the tendency of electrolytic condensers to "deform" after a month or so of nonuse. It takes an extra long time to "re-form" and bring the condensers back up to full charge. This can be quite a drain on the batteries. ("Re-forming" consists in electrically building up

the insulating layer which separates the metal foil and the electrolyte.) If a unit can be used on regular house current, it's a good idea to recharge from the power line after a layover of a month or so.

Damage to Shutter Contacts. Although most of the electronic flash units on the market today are safe to use, there are a few units which send either the full charge or a large pro-



portion of the current through the shutter contacts thus causing arcing across the contacts. This results in such damage as pitting and even welding the parts together. *Do not use a unit of this type with Kodak shutters.*

Effective Candle-power-Second Output. You can compute your own guide numbers if you know the effective candle-power-second (ECPS) output of a unit. You simply insert that figure and the daylight exposure index of the film into the formula for determining guide numbers. Guide No. = $V .063 \times ECPS \times Z$, where Z is the index of the film. This formula is derived from the American Standard formula for calculating Exposure Guide Numbers for Photographic Lamps. Unit manufacturers may either publish the ECPS output of their

(Continued on page 8)

Potpourri

✓ As promised, *Kodak Tri-X Film* is being made available in additional sizes as production can be increased to catch up with demand. It is now also available in 828 and 127 roll film and film-pack sizes, TX-520, TX-518, TX-541, TX-523.

✓ The Kodak Stereo Camera and Kodaslide Stereo Viewer I are being included in an attractive gift package for a list price of \$121.25.

✓ Along comes still another aid to water saving in film processing. In addition to the technique outlined in the No. 2 Photo Notes 1954, *Kodak Hypo Clearing Agent* now does for film what the Kodalk Balanced Alkali treatment does for paper processing. Used according to directions on the package, this agent reduces washing time to 5 minutes. Films of archival permanence result if not more than 150 to 200 sheets of 8 x 10-inch film, or equivalent, are treated per gallon.

✓ A glossy surface for ferrotyping has been added to the Medalist line—*Kodak Medalist Paper F*, Sgl. Wt.,

Glossy, available in grades 1, 2, 3 and 4 in most sizes.

✓ With the renewed interest in available-light photography, many photographers are trying to increase the effective speed of their films by using such high-energy developers as *Kodak Developer SD-19a*. While this procedure just about doubles the speed of films, such as *Kodak Super-XX*, it does not do the same with *Kodak Royal Pan* and *Tri-X* Films. We do not feel that results justify its use with these new films.

Kodak Ready Mounts (for customer mounting of miniature transparencies) have been available in the 135 and 828 sizes in the folded form with three sides already sealed. A package of 50 lists for \$2.60. Now *Kodak Ready Mounts* are being made available in a flat unsealed form for a lower list price—\$1.75 for a package of 100. A cardboard film-cutting guide is provided to facilitate mounting. A household iron can be used to seal the edges.

FLASH EXPOSURE GUIDE NUMBERS FOR KODAK TRI-X FILM (ROLLS AND MINIATURE SIZES)

	4 to 5-inch			6 to 7-inch		
	8	SM-SF	5-25	11-40	2-22	Focal Plane
1/25	220	160	300	370	450	
1/50	190	160	280	330	400	31, 2A 1/100-180
1/100	180	150	240	290	350	1/250-110
1/200	160	140	180	220	260	1/500-80
1/400	120	100	140	170	200	

In polished or Lumaclad reflectors.

Except for No. 11 and 40 lamps, these numbers also apply for *Kodak Ektalux Flashholder*, lamp in normal position. For satin-finished reflector, use $1/2$ lens opening wider.

above all THE CLOUDS



Kodak Pictorial Filters



With the advent of the outdoor picture-taking season, what more appropriate time to get acquainted with the new low-cost colored optical glass filters, the Kodak Pictorial Filters? They are available in yellow, red, and green. They fit the Kodak Combination Lens Attachments, Series IV, V, and VI.

These filters are designed specifically for sky and contrast control in pictures of pictorial subjects made with black-and-white film. They supplement our line of Kodak Wratten Filters which continue to be our recommendation for color films and wherever the most closely controlled transmission is required.

FILTER	FILM	EFFECT (with blue sky)	EXPOSURE INCREASE	
			DAYLIGHT	TUNGSTEN
Yellow	Orthochromatic, such as Kodak Verichrome Film	Clouds show up naturally. Effect of haze is reduced (especially useful in marine scenes and distant landscapes).	One opening larger (twice the exposure)	One opening larger
	Panchromatic, such as Plus-X, Super-XX, Tri-X	Same as above	One opening larger	No change in exposure
Green	Panchromatic— Do not use with orthochromatic film	Gives a natural rendering of the sky, while it lightens greens. Especially good for close-ups of people with sky background because skin tones are well rendered.	One opening larger	One opening larger
Red	Panchromatic— Do not use with orthochromatic film	Darkens a blue sky more than the yellow filter, increases contrast more, gives a darker-than-natural effect which is dramatic, arresting.	Three openings larger (eight times the exposure)	Two openings larger (four times the exposure)

MISSING A GOOD BET?

Modern museums are a far cry from the dusty mausoleums of yesteryear. Today they really tell a story in a forceful, dynamic way, using modern display methods with expert layout and superb lighting. Travelers find them increasingly interesting and useful in filling in the background of the area being visited. Exhibits cover all kinds of subjects, from aardvarks to zymurgy — something to interest and enlighten everyone.

There is abundant material for your camera in either black-and-white or color. Certainly most of the subjects, especially the dioramas, will make standout stereos. These pictures will fill out your travelogues and supply a change of pace from the usual outdoor scenes.

Ask permission first, explaining that they are personal pictures, not for publication. Permission will almost invariably be granted—most curators are very co-operative.

Film. Indoor-type color film is most appropriate for the majority of work in museums. For the few cases where

6 a too-warm color balance results, a

bluish filter can be used.

Flash or Available Light? Since the display lighting used is so artistic, you will probably prefer to use the available light. For color, this will mean long exposures made with a tripod and a cable release on the camera. Small lens openings are usually called for to get enough depth of field at such close working distances. With a fast lens, there are many of the better lighted shots you can get at slow snapshot times with the very fast Kodak Tri-X Film. If tripods are verboten or you don't have one along and there is no existing support to steady the camera, you will have to use flash. This, of course, will "drown out" the display lighting, but will make hand-held shots possible. If the display is animated, flash—but only extension flash—becomes imperative. We have seen excellent shots made with the camera lens held in gentle contact with the window.

Reflections. Since you will be shooting mostly through glass, watch out for reflections. If you use available light, you can usually see if any re-

8 sec. f/8 on Kodachrome Film, Type A



1 sec. f/8 on Kodachrome Film, Type A



lections are going to show in the picture by sighting along the lens axis. If a change in position is not feasible, you can usually eliminate reflections coming from behind you by holding out a dark cloth — a focusing cloth is ideal, or a dark coat will do. In some cases it is possible to eliminate reflections by having the camera lens rim barely touch the glass. Be careful not to press hard against the glass or let anyone bump against the camera or tripod. If using flash, use extension flash from an oblique angle. You can check reflections by using a flashlight from the flash-reflector position. It is usually better to avoid flash when shooting through glass.

Color of the Light. When using color film and available light, you will need to judge the type of light. Is it warm or cold? Try to see the source of light. Keep in mind also that our eyes accommodate themselves to lights of different color so that unless the difference is quite pronounced, they look alike. But your color film will show the difference. It may be desirable or not, depending upon the effect you want. Sometimes you will not be able to see the light source, or, when you can, you may find that a mixture of lights or one or more col-

ored filters are used over the lights. In these cases, you will probably not be able to reproduce closely the warmth or coldness of the lighting. There is no such thing as accurate color photography, but by making an educated guess at the film-filter combination most of your shots will be very effective anyway. For warmer color rendering, use a Kodak Light Balancing Filter of the No. 81 (Yellowish) series; for cooler results, use the No. 82 (Bluish) series. When using Kodachrome Film Type A, with clear flash lamps, use a Kodak Light Balancing Filter No. 81C; Kodak Ektachrome Film Type F requires no filter with clear flash lamps.

Experience has shown that for photographing dioramas illuminated by a rather cold light, such as underwater scenes, the use of a Type A film with a Kodak Skylight Filter yields pleasing results.

The table for color film-filter combinations included in the Kodak Master Photoguide might prove a valuable guide in this type of work.

Exposure. Time exposures with the camera on a sturdy tripod are the order of the day. A cable release is a great help in avoiding camera vibration during exposure. A common ex-

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1½ min. f/8 on Kodachrome Film, Type A

10 sec. f/8 on Kodachrome Film, Type A



exposure with flash

(Continued from page 3)

unit or supply it on request. When properly measured, the ECPS figures should consider not only the light along the axis of the lamp, but also

that spread over the useful field as well. Measurements at the various beam angles can be combined into a single figure for ECPS by following the weighting method outlined in the American Standard for guide-number determination.

missing a good bet?

(Continued from page 7)

posure time for dioramas is 30 seconds at $f/8$, with Kodachrome Film, Type A, and no filter. A sensitive, photoelectric, reflected-light meter is almost a necessity. It is sometimes possible to get tips from the museum people from their own experience.

Bracketing is good insurance, especially for these long exposures where

reciprocity effects are introduced. Give one exposure according to your meter reading, then make another exposure at double the time. In very doubtful cases, make a third exposure at triple the original time. This modification of the usual bracketing procedure seems to work better for the long exposures involved.

Exhibits shown in photographs on pages 6 and 7 are from the Rochester Museum of Arts and Sciences.

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